CLAIMS

What Is Claimed Is:

1. A fiberoptic wavelength combiner comprising:

a collimating lens having a first surface and a second surface, opposite said first surface;

two input optical fibers secured to said first surface, each input optical fiber conducting light at a wavelength that is different from other input optical fibers;

a wedged mirror spaced from said second surface, said wedged mirror having a front surface facing said collimating lens and a rear surface, said front surface provided with a first reflective coating and said rear surface provided with a second reflective coating; and

an output optical fiber secured to said first surface,

whereby light from said at least two input optical fibers is collimated by said lens and made incident on said wedged mirror and its first and second reflective coatings to thereby direct said light back through said collimating lens onto said output optical fiber.

2. The combiner of Claim 1 wherein light collimated by said lens forms a collimated beam for each input optical fiber, and where each collimated beam exits said lens at an angle within a range of 1° to 3°.

3. The combiner of Claim 2 wherein said angle is within a range of 1.8° to 2°.

4. The combiner of Claim 2 wherein said wedged mirror has a wedge angle, relative to a central optical axis through said lens, that is twice said angle of said exiting collimated beam.

5. The combiner of Claim 1 wherein two input optical fibers are used, with a first input optical fiber conducting light of wavelength λ_1 and a second input optical fiber conducting light of wavelength λ_2, wherein λ_1 is different than λ_2.

6. The combiner of Claim 5 wherein said first reflective coating is at least 99% reflective at wavelength λ_1 and transmits at least 99% at wavelength λ_2 and wherein said second reflective coating is at least 99% reflective at wavelength λ_2.

7. The combiner of Claim 5 wherein said output optical fiber is single mode for the longer of said two wavelengths λ_1 and λ_2 and is multimode for the shorter of said two wavelengths.

8. A method of aligning a fiberoptic wavelength combiner comprising:

a collimating lens having a first surface and a second surface, opposite said first surface;

two input optical fibers secured to said first surface, each input optical fiber conducting light at a wavelength that is different from other input optical fibers;

a wedged mirror spaced from said second surface, said wedged mirror having a front surface facing said collimating lens and a rear surface, said front surface provided with a first reflective coating and said rear surface provided with a second reflective coating; and

an output optical fiber secured to said first surface,

whereby light from said at least two input optical fibers is collimated by said lens and made incident on said wedged mirror and its first and second reflective coatings to thereby direct said light back through said collimating lens onto said output optical fiber, said method comprising either:

adjusting orientation of said mirror and locations of all optical fibers relative to a center of said first surface of said lens before fusing said optical fibers to said first surface of said lens; or

fusing said optical fibers to said first surface of said lens and then aligning using a length of graded-index fiber.

9. The method of Claim 8 wherein light collimated by said lens forms a collimated beam for each input optical fiber, and where each collimated beam exits said lens at an angle within a range of 1° to 3°.

10. The method of Claim 9 wherein said angle is within a range of 1.8° to 2°.

11. The method of Claim 9 wherein said wedged mirror has a wedge angle, relative to a central optical axis through said lens that is twice said angle of said exiting collimated beam.

12. The method of Claim 8 wherein two input optical fibers are used, with a first input optical fiber conducting light of wavelength λ_1 and a second input optical fiber conducting light of wavelength λ_2, wherein λ_1 is different than λ_2.

13. The method of Claim 12 wherein said first reflective coating is at least 99% reflective at wavelength λ_1 and transmits at least 99% at wavelength λ_2 and wherein said second reflective coating is at least 99% reflective at wavelength λ_2.

14. The method of Claim 12 wherein said output optical fiber is single mode for the longer of said two wavelengths λ_1 and λ_2 and is multimode for the shorter of said two wavelengths.